



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) Publication number: **0 597 288 A1**

(12) **EUROPEAN PATENT APPLICATION**

(21) Application number: **93116956.9**

(51) Int. Cl.⁵: **B01L 3/00, B01L 9/06**

(22) Date of filing: **20.10.93**

(30) Priority: **11.11.92 FI 925117**

(43) Date of publication of application:
18.05.94 Bulletin 94/20

(84) Designated Contracting States:
AT BE CH DE DK ES FR GB GR IT LI LU NL SE

(71) Applicant: **LABSYSTEMS OY**
Puititie 8
SF-00881 Helsinki(FI)

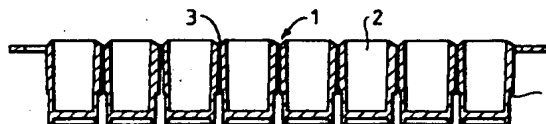
(72) Inventor: **Järvimeki, Karl**
Haukatie 6 as 11
SF-02170 Espoo(FI)

(74) Representative: **Bunke, Holger, Dr.rer.nat.**
Dipl.-Chem.
Prinz & Partner
Manzingerweg 7
D-81241 München (DE)

(54) **Cuvette matrix.**

(57) The invention relates to a cuvette matrix, comprising a row, from which it is possible to detach one cuvette to be placed in a stand. On the outer surface of the cuvette, at an angle from the longitudinal direction of the row of cuvettes, there is a holder member (10), which facilitates the cuvette to adhere to the sides of an opening, after when the cuvette is turned in the opening.

Fig. 1



EP 0 597 288 A1

Field of the invention

The invention relates to laboratory technology and concerns a cuvette matrix which can be used e.g. in diagnostic assay methods.

Prior art

For example in diagnostic assay methods sets of cuvettes comprising of one or more rows of cuvettes are commonly in use. Standard-sized 8*12 microtitration plates and their partial matrices are especially common.

Also such cuvette sets are used, in which the cuvettes have been detachably joined to each other. In this way, just a required number of cuvettes can be used at a time in each case. Such a cuvette set provided with breakable stems is known for example from the patent application publication FI-A-894025 (corresponds e.g. to the publication US-5096672). The cuvette set is connected with a stand which has square holes corresponding to the cuvettes and in each of them resilient holder means for keeping the cuvettes in place.

When single cuvettes detached from the matrix described above are used, a cuvette does not always stay sufficiently satisfactorily stationary in the stand.

General description of the invention

The main object of this invention is to provide a cuvette matrix in which a single cuvette removed therefrom stays better than the known cuvettes in position in the stand.

The most essential feature of the invention is the fact that on the outer surface of the cuvette at an angle relative to the longitudinal direction of the cuvette row there is a holder member, which together with the walls of the cuvette opening of the stand keeps the cuvette tightly in position after it has been turned in the opening.

The invention and its some preferred embodiments are defined in detail in the patent claims.

Detailed description of the invention

The cuvette matrix in accordance with the invention comprises one or more cuvette rows, in which the cuvettes are connected to one another such that when desired, it is possible to detach one or more cuvettes to be used at a time. The cuvette matrix is preferably prepared from some plastic, such as polystyrene suitable for the purpose. For optical measurements, the bottom of the cuvette is made transparent, when so needed. The cuvettes are especially suitable for use in various diagnostic assays to be made with fluid samples. When re-

quired, the cuvettes can be pretreated, e.g., by coating with an antigen of an antibody to be determined.

The cuvettes are meant to be placed in a specific stand which has an opening for each cuvette. The cuvettes stay in the opening by means of friction. The opening is preferably a square by shape, but it may also have another shape, such as a hexagon. The stand with its cuvettes can then be brought for measurement e.g. into a vertical measurement photometer.

The cuvette preferably is by its outer surface slightly downwardly tapering, whereby its positioning in the stand is easier. On the outer surface there may also be an extension or like which facilitates the positioning of the cuvette at a certain height relative to the stand.

Each cuvette has on its outer surface a holder member, which, when turning the cuvette, fixes the cuvette even more rigidly to the opening. Preferably the holder member is essentially at an angle of 45° from the longitudinal direction of the row of cuvettes, whereby the cuvette is correspondingly turned essentially by 45°. Preferably there are two holder members on the opposite sides of the cuvette.

Preferably the holder member is an extension on the surface of the cuvette. The extension is best a vertical plane, which, when turning the cuvette, steadily positions against the vertical wall of the opening of the stand. The extension may also be e.g. a nodule or a ridge of some kind, whereby the wall of the opening may have a notch or groove corresponding thereto.

Preferably the opening of the stand further has also resilient pressing members, which keep the cuvette in position.

In the following, an embodiment of the invention is described as an example. In the drawings of the description:

Fig. 1 shows a cuvette matrix seen from the front;

Fig. 2 shows the same matrix seen from above;

Fig. 3 shows a cuvette matrix seen from the side;

Fig. 4 shows the same cuvette seen from above; and

Fig. 5 shows a stand for cuvette matrices seen from above.

The cuvette matrix of the figures, and its stand are by their principal solution similar to those described in the US publication 5096672. Said publication is incorporated as a reference herein.

In the cuvette matrix 1, the cuvettes 2 are connected to each other such that a desired number of cuvettes can be detached from the matrix by folding the stem 3 between the cuvettes. The cuvettes are circular by their cross-section and slightly

narrower by their lower part. The entire matrix or a part thereof can be placed in a stand 4, which has 8*12 holes 5 with square cross-section. The side of the hole is slightly broader than the diameter of the bottom of the cuvette. The cuvettes can thus be positioned into the holes of the stand. However, the side of the hole is slightly narrower than the cuvette diameter above the bottom. The cuvette thus adheres to the hole by means of friction.

For facilitating folding, the stem 3 has been narrowed. In the solution of the figure, there is a narrowing at each end, but also e.g. one narrowing may be made in the center, whereby the stem always breaks symmetrically.

The holes 5 form eight horizontal rows marked with letters (A-H) and twelve vertical columns marked with numerals (1-12). The holes are bounded by a rectangular frame and its intermediate walls. The intermediate walls 6 parallel with the vertical columns are stiff and continuous. Also, every second intermediate wall 7 of the horizontal rows is continuous and stiff.

Starting from the first intermediate wall 7 from the edge, parallel with the horizontal rows, every second intermediate wall parallel with the rows has been broken at the central line of the vertical column vertically; but obliquely relative to the intermediate wall and such that a small gap is formed between the broken ends. The fingers 8 thus formed parallel with the intermediate walls slightly bend on a horizontal plane. The intermediate walls are at the fingers slightly thicker.

One corner of the stand 4 is chamfered, which facilitates the identification of the correct position of the stand e.g. automatically in analyzer devices.

The upper surface of the intermediate walls 6 and 7 and an extension on the inner edge of the frame abut on a shoulder 9 on the outer surface of the cuvette. In this way, the cuvettes always position at the same height on the stand.

In each cuvette 2, there is at an angle of 45° from the longitudinal direction of the cuvette row on opposite sides beneath the shoulder 9 a vertical planar extension 10. When a row formed by two or more cuvettes is placed in the stand, 3, the extensions position on the corners of the holes 5. A continuous cuvette row always stays well in position due to a friction caused by a potential warpage, and to the so-called "desk-drawer effect". When a single separate cuvette is used, it is turned in the hole of the stand such that the extensions position against the walls of the hole. In this case, the fingers 8 press the cuvette harder and the cuvette stays well stationary.

Claims

1. A cuvette matrix, comprising at least one row formed by two or more interconnected cuvettes, from which row it is possible to detach one cuvette to be placed in a stand having an opening for the cuvette, **characterized** in that on the outer surface of the cuvette, at an angle from the longitudinal direction of the row of cuvettes, there is a holder member (10), which facilitates the cuvette to adhere to the sides of the opening.
2. A cuvette matrix according to Claim 1, comprising by its cross-section square opening for the cuvette, **characterized** in that the holder member is essentially at an angle of 45° from the longitudinal direction of the rows of cuvettes.
3. A cuvette matrix according to Claim 1 or 2, **characterized** in that the holder member is an extension (10).
4. A cuvette matrix according to Claim 3, **characterized** in that the extension is a plane (10).
5. A cuvette matrix according to any of Claims 1 - 4, **characterized** in that there are two holder members (10) positioned on the opposite sides of the cuvette.

Fig. 1

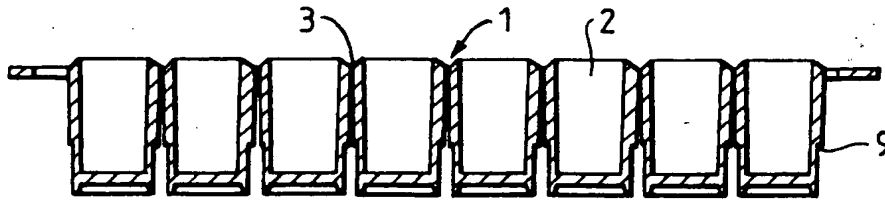


Fig. 2

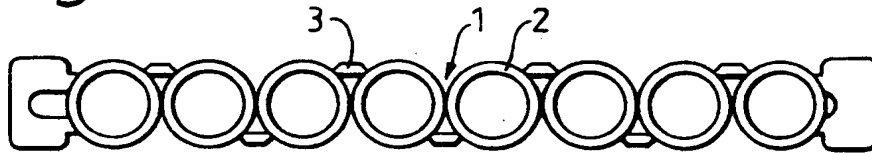


Fig. 3

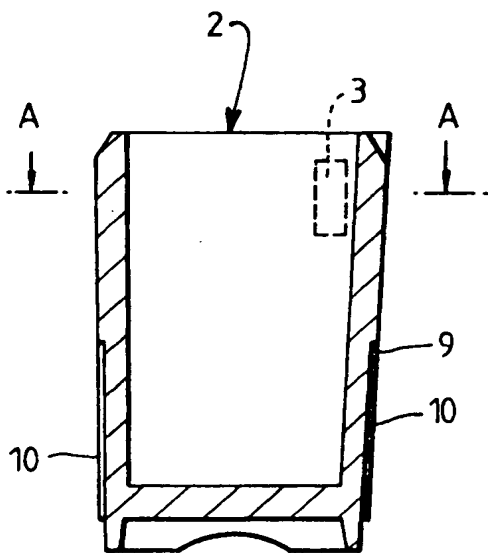


Fig. 4

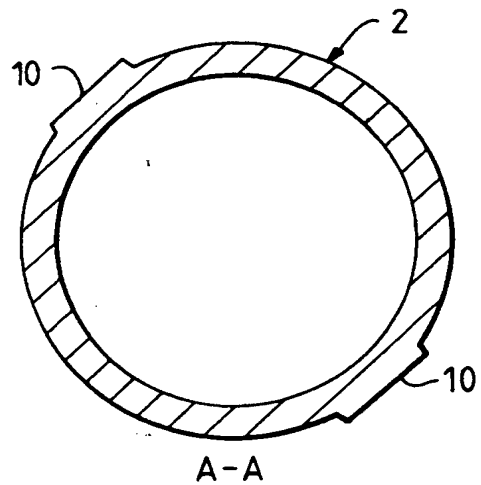
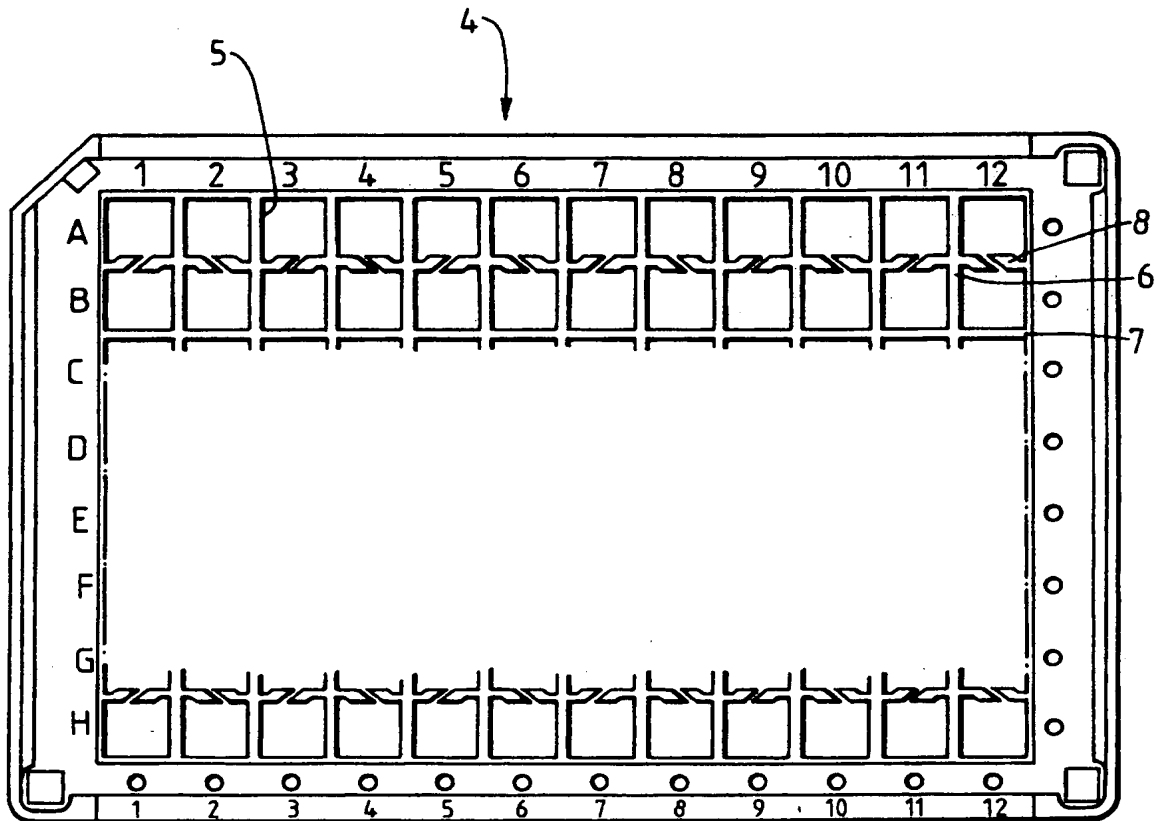


Fig. 5





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 93 11 6956

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CL5)
D,Y	EP-A-0 415 307 (LABSYSTEMS OY) * the whole document *	1-3	B01L3/00 B01L9/06
P,Y	WO-A-93 00420 (COSTAR CORPORATION) * page 15, last paragraph - page 16, paragraph 1; figures *	1-3	
A	US-A-5 080 232 (LEONCAVALLO ET AL.) * column 4, line 23 - column 5, line 10; figures 8-12 *	1-5	
A	GB-A-2 064 998 (HERAEUS CHRIST GMBH) * the whole document *	1-5	
			TECHNICAL FIELDS SEARCHED (Int.CL5)
			B01L G01N
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 3 February 1994	Examiner Lipp, G
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons * : member of the same patent family, corresponding document			

EPO FORM 1503 01.92 (P04C01)